DOCUMENT RESUME

ED 149 983 SE 023 452

TITLE	Environmental Education, Values for the Future: Environmental Ethics. Grades 6-8.
INSTITUTION	Illinois State Office of Education, Springfield.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	77
GRANT	IOE-551-2-75
NOTE	52p.; For related documents, see SE 023 448-457 and SE 023 459-465; Page 9, "Composting Generates Heat" removed prior to being shipped to EDRS due to copyright restrictions
EDRS PRICE	MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS	*Elementary Secondary Education; *Environment; *Ethics; *Instructional Materials; Interdisciplinary Approach; Learning Activities; Middle Schools; Natural Resources; Science Education; *Teaching Guides; Values
IDENTIFIERS	Elementary Secondary Education Act Title III

ABSTRACT

This booklet on environmental ethics is one of a series in environmental education for grades K-12. The concept of man's role in helping to preserve the natural order and the importance of maintaining a pleasant environment is presented in this booklet for grades 6-8. Five basic concepts are listed, along with the behavioral objectives, subject areas, key words, and definitions associated with each. Teachers and students are given three activity options for each basic concept. Information for these activities includes materials and resources needed, procedures, discussion questions, further activities, and sample worksheets. (MA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED149983

ENVIRONMENTAL ETHICS

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Michael D. Teeley

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34
TITLE IV C ESEA

SE 023 452

TABLE OF CONTENTS

Page

Explanation of Concept area 1

Time of the Year Notes

Ethics 9, Option 2 - Early fall 6
Ethics 9, Option 3 - Spring or fall 10

Synopsis

Ethics 9: At the completion of this unit the student will be able to list ways in which wise use of the environment is guided by a desire to preserve the natural order.

Option 1 - Students prepare a visual representation of topic areas through the use of different media. .. 3
Option 2 - Students make a compost. .. 6
Option 3 - Students investigate the effects of soil use on the environment. .. 10

Ethics 10: At the completion of this unit the student will be able to demonstrate that the earth's resources exist for all living things not just man.

Option 1 - A study of the abuse of the environment in advertising is conducted. .. 13
Option 2 - Students play a game that points out the abuses of advertising. .. 14
Option 3 - Through viewing a film the students discuss dependencies in nature and chart these dependencies. .. 20

Ethics 11: At the completion of this unit the student will be able to explain how certain lifestyles enable man to live as a complimentary part of the environment.

Option 1 - Students investigate ways in which man does not live in harmony with nature. .. 24
Option 2 - Students use natural dyes to dye clothing. .. 25
Option 3 - Students become more aware of their environment by heightening their senses. .. 26

Ethics 12: At the completion of this unit the student will be able to list three ways in which the environment contributes to the physical and psychological well-being of living things.

Option 1 - Students construct a collage and design a parking lot. .. 30
Option 2 - Students measure lung capacity of smokers versus non-smokers. .. 31
Option 3 - Several stresses are placed in the classroom environment forcing the students to decide which to remove. .. 35

Table of Contents

Ethics 13: At the completion of this unit the student will be able to give an example of how, by protecting the earth, it will be better able to meet the needs of all living things now and in the future.

Option 1 - Students debate on gas allotments through the use of "roles". .. 37
Option 2 - Students are made part of an extremely crowded situation to test their reactions. .. 42
Option 3 - Students investigate local plant and animal life by taking a nature walk. .. 43

EXPLANATION OF CONCEPT AREA

ETHICS - The goal of any environmental education program should be to assist students in the development of a system of values consistent with our role as stewards of our environment.

To this end we begin with the development of a basic idea of individual needs and the need for sharing. From this we then explore the wonders of our environment.

We then build the concept of stewardship based upon our personal lifestyle and attitudes.

In grades 6-8 we present the idea of man's role in helping to preserve the natural order and the importance of a pleasant environment for now and the future.

In high school the idea of a personal value system is developed and tested for its applicability to our own society and the world environment.

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list ways in which wise use of the environment is guided by a desire to preserve the natural order.

SUBJECT AREAS:

Art, Science, Social Studies

KEY WORDS AND DEFINITIONS:

Harmoniously - in harmony; in a pleasing way

Ordinances - rules or laws

Media - method of showing or telling something

Organic waste - waste from some organism which was at one time living

Compost - a decaying mixture of organic waste

OPTION #1 - two weeks

MATERIALS AND RESOURCES

Posterboard/construction paper
Markers, pens, and pencils
Cameras and film

OPTIONAL:

Movie camera and projector
Slide projector
Overhead projector and transparencies
Videotape

PROCEDURE:

1. In this option students will formulate a visual representation of topic areas through the use of different media. To begin the activity the teacher should list examples of the following topic areas:

   a. The immediate environment (home, school, neighborhood, etc.)

   b. Things we need to survive (water, air, etc.)

   c. Pollutants or contaminating influences (trash, smog, etc.)

   d. Man living in harmony with his environment (reforestation, cleaner cars, etc.)

   e. Ways in which man lives unharmoniously with his environment (littering, wasting goods, etc.)

2. Next, the teacher must divide the students into small groups.

3. Students are given a topic and they are to present this topic in any of the following ways:

   a. Poster

   b. A photograph presentation

   c. A super 8 movie

   d. A slide presentation

   e. Overhead projector

   f. Videotape

   g. Other methods

OPTION #1 cont.

4. Assign each group a topic area and a method of presentation, for example, a slide presentation on the "Things We Need to Survive". Here the teacher can use a great amount of discretion in allowing for individual student abilities. If care is taken in assigning groups, topics and presentations, a teacher has a great amount of flexibility in allowing for individual differences.

5. Allow approximately two weeks for students to prepare their presentations. Have each group then present their topics to the class.

DISCUSSION QUESTIONS

1. Why should humans develop an ecologically sound way of thinking, feeling, and acting toward the earth?

2. What things can we change to be able to live more harmoniously with each other and our environment?

3. What does every person need just to survive? Why?

4. Can your parents and neighbors help you decide what is important? Why?

5. What do you feel constitutes your environment? Why?

6. If we protect the earth will it continue to meet the needs of all living things, now and in the future? Explain.

7. Can you think of any things that have been done in the past that have hurt the environment?

8. What has been done to right the past wrongs?

9. What can we learn from this presentation?

10. What trends and results do you see when looking over the presentations?

11. How did the presentation help us to develop the understanding we are studying?

12. How can we do more to cure and protect our environmnnt?

13. Where do we go from here?

14. What are some future projects we can undertake?

15. What trends do you see today involving environmental ethics?

OPTION #1 cont.

16. Which is greater - man's ability to change his environment or his ability to adapt to change? Why?

17. What can we learn from studying the last question?

18. Can you compile and chart the contaminating influences in your neighborhood? Name some.

19. What do the concluded charts show us?

20. How do the things we have found diminish the quality of our lives and environment?

21. Can you think of any other things that cause us to live harmoniously with each other and our environment?

22. What can we do to change the findings we have obtained?

23. Does the way in which we perceive the earth affect our harmony with it?

24. In what ways can we, the government, and industry make our environment more harmonious?

25. What does the presentation show us about our neighborhood?

26. Have we learned that if humans develop an ecologically sound way of thinking, feeling, and acting toward nature we will then be able to live harmoniously with each other and our environment?

27. What can we do?

FURTHER ACTIVITIES

1. Find out about community pollution control ordinances. Are they enforced?

2. Find out about local industrial, governmental, and commercial activities concerning air pollution control.

3. Find out how your community gets rid of trash, garbage, and other solid wastes.

4. Learn about local food inspection and consumer protection laws.

OPTION #2 - 2-3 days in the early fall

MATERIALS AND RESOURCES

An old garbage can with holes drilled in it for aeration
A small amount of dirt
Thermometer
Coffee cans
Grass clippings and other organic materials
Teaching Science with Garbage, available E^2 Office

PROCEDURE:

1. Discuss the need for fertilizers.
2. Explain how to set up a compost and have the students do it.
   a. Obtain a coffee can or one similar in size.
   b. Drill holes in the can, about one per square inch.
   c. Place organic waste into the can.
   d. Sprinkle a thin covering of dirt over the organic material.
   e. Moisten but do not soak the mixture. It must be moist if it is to work.
   f. You may add more material each day; however, you must cover it with dirt each time.
   g. Turn the mixture over once a week.
   h. Be patient. It takes time to work.
3. Label the compost and set aside until spring.
4. Air out prepared compost two weeks in advance.
5. Students shall get a feel of the compost.
6. One student shall take a thermometer, place it in the middle of the compost, and read it quickly.
7. Discuss the results.
8. Read the article included in this unit and discuss it with the students.
9. Discuss the use of compost and any results if it is widely used in town.

OPTION #2 cont.

DISCUSSION QUESTIONS

1. What is the relationship between composting and fertilizers?
2. Why do we need fertilizers? What do they do?
3. What makes minerals leave the ground? If we let everything rot where it died, would the minerals go back?
4. How could we do this without letting grass clippings and leaves cover the lawn which isn't feasible?
5. Can we remove the material and spread it later?
6. Why was the compost hot?
7. Can we compare this to ourselves in any way? (Breaking down of food creates body warmth.)
8. Could we use compost instead of fertilizer?
9. Do you think your parents would start a compost pile?
10. Would this mean you would have less garbage?
11. Would this require less garbage men if all of us did it?
12. Would it hurt the fertilizer business significantly?

OPTION #2 STUDENT DIRECTIONS

1. Obtain a coffee can or one similar in size.

2. Drill holes in the can, about one per square inch.

3. Place the organic waste into the can.

4. Sprinkle a thin covering of dirt over the organic material.

5. Moisten but do not soak the mixture. It must be moist if it is to work.

6. You may add more material each day; however, you must cover it with dirt each time.

7. Turn the mixture over once a week.

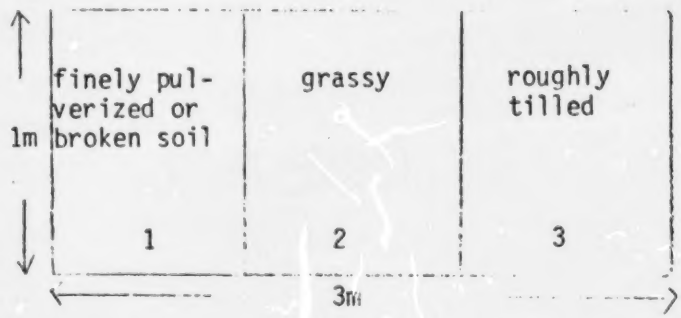
8. Be patient. It takes time to work.

PAGE 9 "COMPOSTING GENERATES HEAT"
REMOVED PRIOR TO BEING SHIPPED TO
EDRS FOR FILMING DUE TO
COPYRIGHT RESTRICTIONS.

OPTION #3 - This option should be done in the spring during the rainy period or in the fall.

MATERIALS AND RESOURCES

Sloping plot of land three meters by one meter
String
Stake
Shovels



PROCEDURE:

1. Select a suitable area with a good steep slope and a grassy surface.
2. Stake the area out with stakes and string so that you have three equal plots, 1 x 1 meter. (See Figure 1 above.)
3. In sections 1 and 3 till the ground and remove all the roots and grassy pieces.
4. In section 3 stop at this point. In section 1 grind the dirt much finer and pack it down smooth.
5. You can now wait until you get rainfall or use a watering can to simulate rainfall.
6. The idea is to compare the effects of a natural occurrence, rainfall, on a disturbed plot of land and a natural area.
7. Plot 1 will have more runoff and erosion than 2 or 3 and 3 will have little evidence of the benefits of rain. Site 2 should have no erosion and definite growth.
8. Keep up the "rainfall" analysis as long as it is showing comparisons.
9. You can vary the heignt and amount of the water poured on each area to see if there are differences.

DISCUSSION QUESTIONS

1. Which area made the best use of the rainfall? Explain.
2. Where dowwe see soil in this condition?
3. How has farming changed over the years?
4. How has the dustbowl problem affected our way of thinking about soil and management?
5. Which plot of land is closest to a "natural system"?

OPTION #3 cont.

6. Which plot is most likely to resist erosion and make the best use of rainfall?
7. How do we use this data in our "management" activities in our area?
8. How can we apply this information?

ETHICS 10

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to demonstrate that the earth's resources exist for all living things not just man.

SUBJECT AREAS:

Language Arts, Science, Social Studies

KEY WORDS AND DEFINITIONS:

Ecopornography - using the environment to sell a product that is either detrimental to or non-related to the environment

Propaganda - the method influencing people to believe certain ideas and to follow certain courses of action

OPTION #1

MATERIALS AND RESOURCES

Several examples of advertisements which could be classified as ecopornography "Ecopornography or How to Spot an Ecological Phony" by Thomas Turner, The Environmental Handbook, edited by Garrett DeBell, available E^2 Office

PROCEDURE:

1. Bring out some examples you have obtained of ecopornography and non-exploitative environmental advertising. Read them and distribute them among the class. Discuss.

2. Assign the students to bring in five examples of each of the above. If possible time the beginning of this unit so that it begins on Friday, giving the students the weekend to gather information.

3. Prior to class time have the students prepare written answers to the discussion questions listed below. Use a basis for class discussion.

4. Have the students rank the advertisements from most abusive to least abusive of the environment.

DISCUSSION QUESTIONS

1. Is the company advertising the apparent solution to a problem actually prolonging it or causing a greater problem?

2. Do press releases or ads obscure the issue?

3. Does the advertisement talk about benefits before they are realized or when they are doubtful?

4. Is the ad really suggesting more dangerous alternatives?

5. How is the environment being used to "sell" you something?

6. Is the environment an important part of the product?

7. Make a list of products that make unfair use of the environment.

OPTION #2

MATERIALS AND RESOURCES

Propaganda Game, included
List of propaganda techniques, included
Magazine advertisements

PROCEDURE:

To properly prepare the students to play Propaganda, these steps should be followed:

1. Discuss and define the seven propaganda techniques as shown on the following page.

2. Show sample advertisements using techniques.

3. Discuss the questions below.

4. Play the Propaganda Game. The rules and explanation are on the following pages.

DISCUSSION QUESTIONS

1. How does propaganda work?

2. Are you influenced by propaganda? (Discuss class examples.)

3. Do you ever use propaganda? (to convince mom or dad)

4. Are all types of propaganda effective on all people at all times? Why or why not?

FURTHER ACTIVITIES

1. Have a contest to find the worst ecopornography. After making a selection, inform the advertiser in a letter with copies of the media.

2. Make a school display of the ads with satirical captions and rewrite the ads in a more truthful manner. Send your results to the local newspaper.

3. Ask your students to define a lifestyle that is in complete harmony with nature.

OPTION #2 [illegible]IQUES

TECHNICAL JARGON

Use of technical language or unfamiliar words for the purpose of impressing people

VAGUE GENERALIZATIONS

Use of vague general statements without proof which makes it difficult for people to argue about what you have said

EMOTIONALIZATION

Words or pictures which stir very strong feelings within us

PLAIN FOLKS

User places himself or his product on a level of neighborly intimacy with the reader or listener

BAND WAGON

Attempt to influence you by implying that that is what is popular or what the majority is doing

APPEAL TO PRESTIGE

Attempt to induce you to buy or believe by stating or suggesting that such action will benefit you or give you prestige

TESTIMONIAL

Persons or objects for which we have a strong sentiment of respect and esteem, or which at least possess some degree of fame or prestige, endorse that which we are asked to believe or buy.

OPTION #2

PROPAGANDA GAME RULES

1. Each player receives one ROAD TO RATIONAL DECISIONS chart.
2. Each player receives one token to place at the zero position on his chart.
3. Each player receives one prediction sheet.
4. Teacher holds up or reads the first example.
5. Each player secretly writes the number of the technique he thinks is used in the example on his prediction sheet. If no technique is apparent to him, he writes "0". There is a one minute time limit for decisions.
6. After all players in the class have written their prediction, the entire class determines the correct answer based upon majority rules.
7. All players who predicted the majority's choice of a correct answer, may move forward one space. If wrong, move back one space.
8. Once several rounds have been played, you may introduce the PERSUASION RULE which is explained on the attached sheet.
9. Competition is among individuals throughout the room, not among groups.
10. A time limit for play should be set before beginning. The object is to get as far on the ROAD as possible during the game.

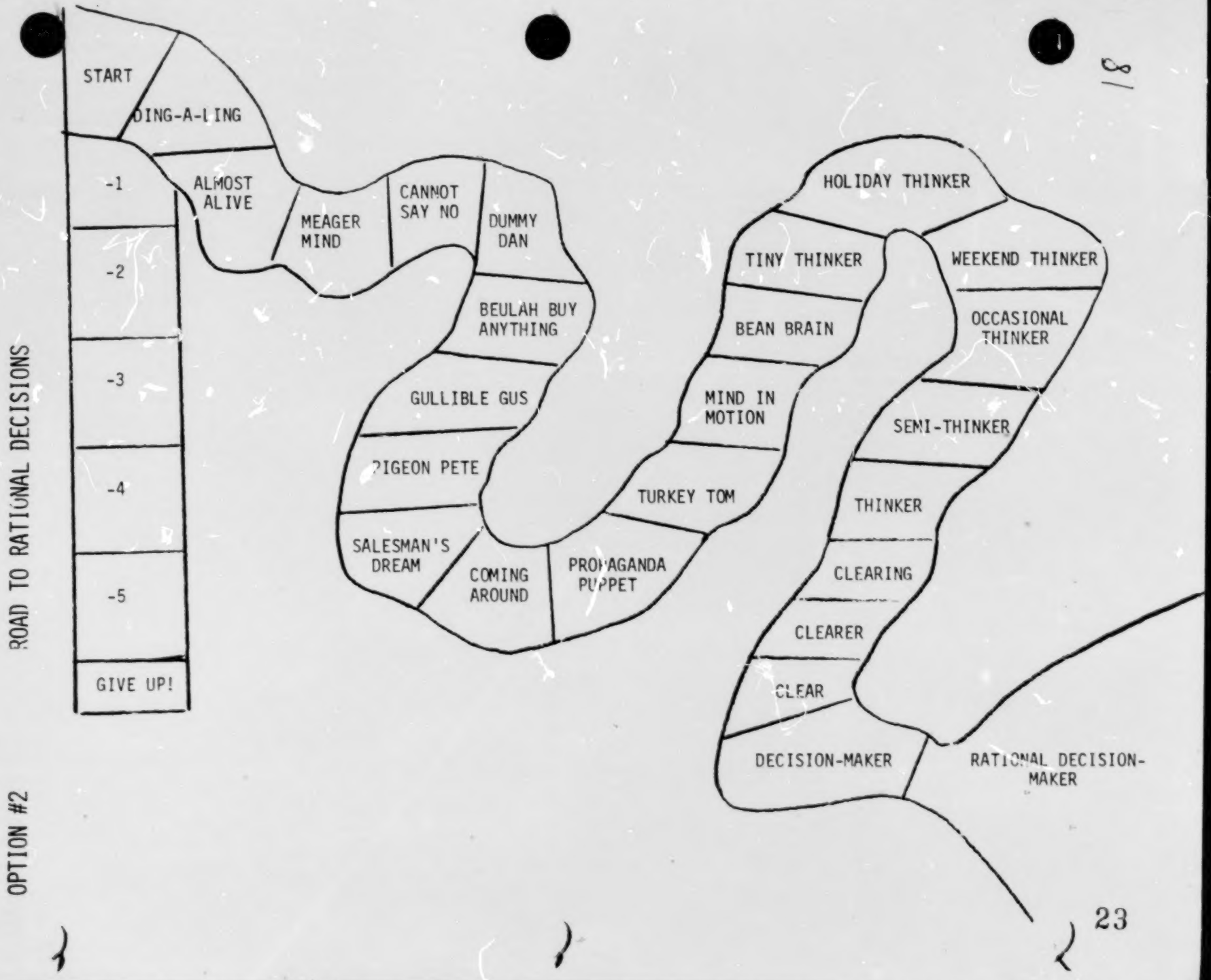
OPTION #2

PREDICTION CHART

1. TECHNICAL JARGON
2. VAGUE GENERALIZATIONS
3. EMOTIONALIZATION
4. PLAIN FOLKS
5. BAND WAGON
6. APPEAL TO PRESTIGE
7. TESTIMONIAL
0. NO TECHNIQUE APPARENT

example	prediction	persuade	example	prediction	persuade	example	prediction	persuade
1			20			39		
2			21			40		
3			22			41		
4			23			42		
5			24			43		
6			25			44		
7			26			45		
8			27			46		
9			28			47		
10			29			48		
11			30			49		
12			31			50		
13			32			51		
14			33			52		
15			34			53		
16			35			54		
17			36			55		
18			37			56		
19			38			57		

17


START
DING-A-LING
-1
-2
-3
-4
-5
GIVE UP!
ALMOST ALIVE
MEAGER MIND
CANNOT SAY NO
DUMMY DAN
BEULAH BUY ANYTHING
GULLIBLE GUS
PIGEON PETE
SALESMAN'S DREAM
COMING AROUND
PROPAGANDA PUPPET
TURKEY TOM
MIND IN MOTION
BEAN BRAIN
TINY THINKER
HOLIDAY THINKER
WEEKEND THINKER
OCCASIONAL THINKER
SEMI-THINKER
THINKER
CLEARING
CLEARER
CLEAR
DECISION-MAKER
RATIONAL DECISION-MAKER
ROAD TO RATIONAL DECISIONS
OPTION #2

OPTION #2 PERSUASION RULE

The persuasion rule is to be introduced into the Propaganda Game after familiarity of basic format of the game has been established.

1. After each individual has revealed his answer, the minority voter, if any, must try to persuade the popular voters to change their answers to his.

2. When the minority voter completes his argument (one minute limit), the popular voters only, re-vote in secret. They may vote the same as they did on the first vote, or they may change their vote to that of the minority voter(s). More than one minority voter may have argued a choice and, therefore, the popular voters may have to choose between their original prediction and one or several alternatives presented in the persuasion.

3. The popular voters then reveal their answers. Whoever is left as the minority voter(s) after the persuasion round must accept the majority rule. There may not be any further persuasion rounds for that example.

4. Game proceeds in normal manner from that point on, except now any popular voter who changed his prediction during the persuasion round, must use his new choice instead of his original prediction to determine whether he moves.

Variation to help when working with large groups over twenty.

Each person is given a determined number of the example cards to study. Each individual secretly writes his prediction for each picture. Switch example cards between persons as they finish filling in their predictions. When all have made predictions for all example cards, follow normal procedure of play, deleting only the one minute for predicting. During normal procedure of play, teacher should hold up one example at a time for person to determine correct technique and scoring.

This method will allow each student to study the ad and using all statements in the ad to determine the predicted technique, rather than using just a distant visual impression to determine the technique used.

If the class is large it may also prove helpful to divide the class into groups and have the groups vote as a unit.

OPTION #3

MATERIALS AND RESOURCES

One or more of the following:

Access to a wooded lot or area with a pond or creek
Film, The Lorax
Eco-Catastrophe, a short story by Paul Ehrlich
Sand County Almanac, by Aldo Leopold
The Biosphere from the Spaceship Earth Series, Hawkhill Associates, Inc.

(All media available from the F^2 Office.)

PROCEDURE:

1. Have the students study or view one of the resources listed above. They are to keep in mind what dependencies are apparent. Discuss what "dependencies in nature" means.

2. Ask the students to look for signs of their roles within these dependencies.

3. Have them study the dependency chart for trees, Chart #1. Discuss what might be missing in this chart.

4. Have the students choose a topic and fill out a dependency chart, Chart #2, for their particular choice.

5. In making their chart students may want to use pictures, etc. to show dependencies.

6. Display charts or have the students explain them to the class.

DISCUSSION QUESTIONS

1. Who should be responsible for the environment?

2. Who or what is the dominant factor in the environment?

3. What is man's role in the environment?

4. Is dependence a one-way situation?

5. How can man become more a part of nature?

OPTION #3 cont.

The following poem lines are excerpts from the poem, "Mistress of Vision, stanza XXII:

All things by immortal power,

near or far,

Hiddenly

To each other linked are,

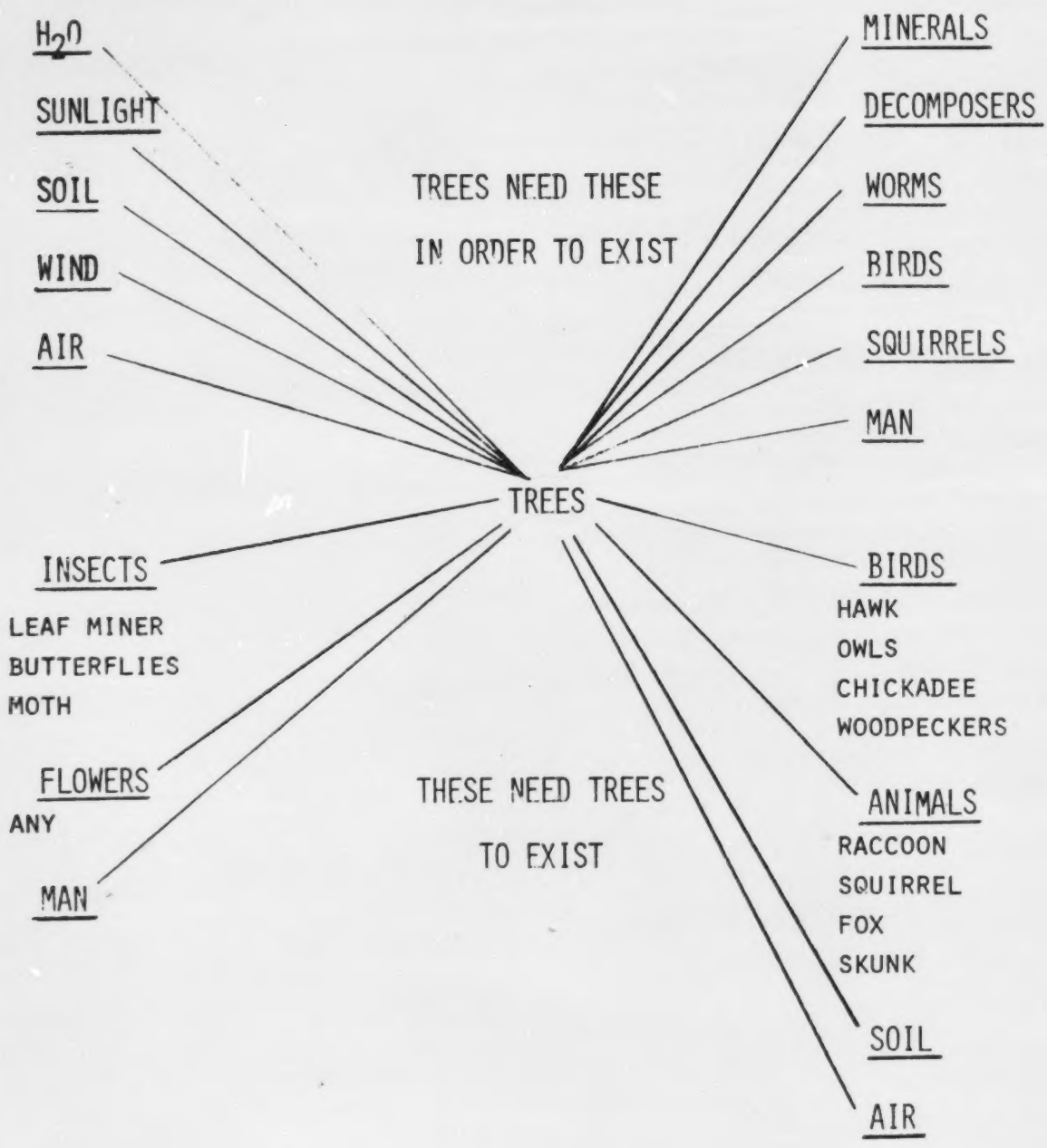
That thou canst not stir a flower

Without trouble of a star;

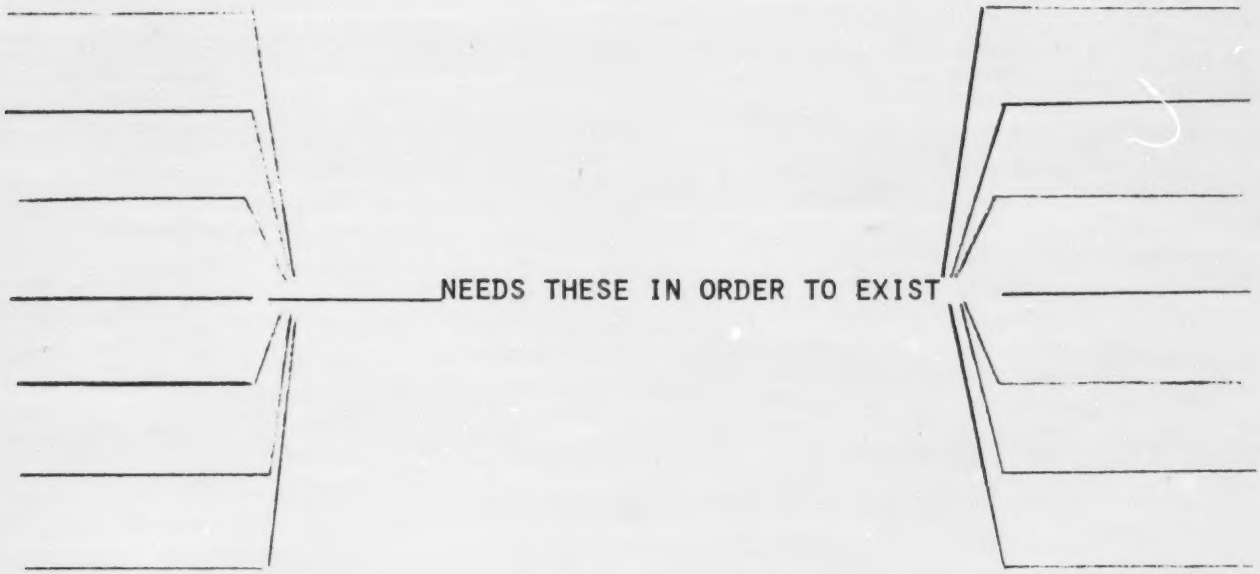
Francis Thompson

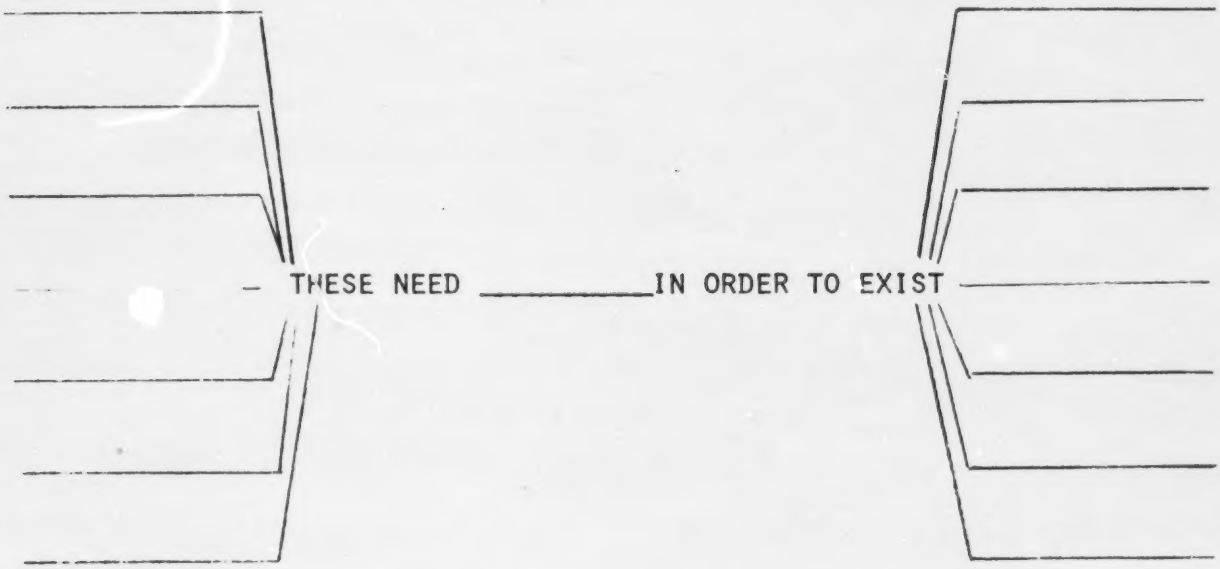
OPTION #3

CHART 1



OPTION #3 CHART #2





BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain how certain lifestyles enable man to live as a complimentary part of the environment.

SUBJECT AREAS:

Social Studies, Science

KEY WORDS AND DEFINITIONS:

Complimentary - in harmony; fitting into the whole structure without causing disruption to the system

OPTION #1

MATERIALS AND RESOURCES

Articles on the Alaskan Pipeline, pesticides, the Aswan Dam, oil spills in the ocean and any other articles relating to how man fights nature

Some suggestions:

Sand County Almanac
Never Cry Wolf
Limits to Growth

Filmstrips - Can Man and Nature Coexist, Current Affairs, Wilton, Conn.
Human Issues in Science, Scholastic Magazines, Inc,

PROCEDURE:

1. Study the articles and, if possible, show the filmstrips related to how man does not live in harmony with nature.

2. Have the students scrutinize what is happening and what is the cause. Have students list the cause in each case.

3. Discuss what might be done to improve the situation.

4. Have students list as many ways as they can think of in which man helps nature. (Examples - reforestation, population control of animals like the kangaroo, preserves, etc.)

5. Divide the topics among the students and have them prepare a short presentation on the topic they have chosen.

6. Have the students compare the ways in which man has harmed his environment and the ways in which he is trying to improve it.

DISCUSSION QUESTIONS

1. What other things has man done to the environment in an uncomplimentary way?

2. How did these things affect the environment?

3. Do you always live as a complimentary part of the environment?

4. What can man do to live more in harmony with the environment?

5. Do you think that man must bring nature under control to live? Explain.

6. What makes man destroy the environment?

7. Why is it some people don't seem to care what happens?

8. Why are people now trying to protect the environment?

9. Why do you think companies which were polluters (electric companies, oil corporations, etc.) are trying so hard to convince people they are helping the environment?

25

OPTION #2

MATERIALS AND RESOURCES

Inexpensive fabric
Sewing accessories
Dyeing area
Dyeing basin or tub
Chart paper
Locale where natural dyes can be found and picked
Natural Dyes: Plants and Processes by Jack Kramer, Charles Scribner & Sons

Alternative: Foxfire*

PROCEDURE:

1. Research the types of materials and natural dyes that were used in making clothing in colonial times.

2. Determine which of these natural dyes can be found in your locale. Make an attempt to find them.

3. Make a chart of these dyes, what they look like in natural form, and where they can be found.

4. Have the students make dyes and attempt to dye some fabric with their natural dyes.

5. Students may wish to extend the unit into dying some homemade clothing.

DISCUSSION QUESTIONS

1. In what ways were the colonists aware of their environment?

2. List as many ways as you can that illustrate the colonists' respect for their environment.

3. Compare and contrast the colonists' attitude toward the environment with ours.

4. Was there a need in colonial days to conquer the environment? If yes, how has this attitude influenced our modern culture and its attitude toward the environment?

5. Have attitudes toward the environment changed?

6. Why did colonial America have less of an impact on the environment?

7. What are some examples of how modern home life demands more of the environment as compared to colonial home life?

8. What are some ways the individual in our society can have less of an impact but continue the same basic lifestyle?

*The Foxfire volumes present an excellent view of mountain lifestyles. Their lifestyles co-exist with nature; therefore, reading about these people would help meet the objective. The original, The Foxfire Book has a chapter on home remedies (p. 230) is an excellent source to illustrate their use and respect of nature.

OPTION #3

MATERIALS AND RESOURCES

Magnifiers
Tweezers
Bucket of dirt (not potting soil)
Blindfold or handkerchief

PROCEDURE:

1. In this unit the students will become more acutely aware of their environment through the use of their senses.

2. The term acclimatization means having people learn to become part of nature or merge with the environment.

3. Use acclimatization as a means of having students realize they can be a complimentary part of their environment.

4. Have students experience different encounters involving their senses.

   a. Blindfold the students and have them smell various natural,things. For example, a flower, a broken piece of pine, mold, etc.

   or

   b. With tennis shoes on again blindfold them and have them wade or crawl in a very shallow creek.

   or

   c. Have the students feel objects such as moss, fish scales, and fur.

   or

   d. Have the students lie on the ground and close their eyes listening to the sounds of nature.

   or

   e. Have the students write a story pretending they are a plant or an animal.

5. Give each student a chunk of dirt and have them examine it

6. Have the students share their experiences and feelings with the class.

DISCUSSION QUESTIONS

1. Were you comfortable doing the things you did?

2. How did you feel during each experience?

3. Could you tell what you experienced in each case?

4. Do you feel that you live as a complimentary part of the environment?

FURTHER ACTIVITIES

Either as an introduction or conclusion to this unit, it would be extremely beneficial to students to show one of the filmstrips series listed below:

What Do You See, Walt Disney

Discovering Your Senses, Coronet Instructional Media

Environmental Awareness, Centron Educational Films

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list three ways in which the environment contributes to the physical and psychological well-being of living things.

SUBJECT AREAS:

Mathematics, Health, Social Studies, Science

KEY WORDS AND DEFINITIONS:

Stress - a strain placed upon a system

OPTION #1

MATERIALS AND RESOURCES

Large sheets of paper
Magazines suitable for cutting up
Tape recorders
Camera or sketch pad
Pencils
Rulers
Ecology Magazine

PROCEDURE:

1. Students begin by constructing a wall collage using scenes of nature. Cover the entire wall. This way they create one environment. As paper is thrown on the floor tape it to the mural environment after school; in this way, their environment is destroyed.

2. Divide the class into groups to compete for the designing of the greatest parking lot in the world.

3. Give students ample time to think about and structure to perfect their creations.

4. Have the students display these creations on another wall.

5. Then have the students bring the following to class:

   a. sounds that make you feel angry, sad, happy
   b. scenes that make you feel angry, sad, happy

DISCUSSION QUESTIONS

1. Look at the walls - one of nature and one of parking lots. Which appeals and why? Are there good parts of both?

2. How many had trees in their parking lots?

3. What makes you feel sad or angry? Are any of these in your parking lot?

4. What makes you feel happy? Are any of these in your environment scenes?

OPTION #2

MATERIALS AND RESOURCES

Round balloons, one per student
Graph paper
Large calipers
Rulers
"The Respiratory System and Smoking", Chicago Lung Association, 1973

PROCEDURE:

1. Give each student a balloon and explain that you are going to find out the lung capacity of each of them.

2. Have the students blow up the balloon in one continuous exhale. ONE BREATH ONLY. No fair to breathe in between.

3. Have the students tie the balloon closed being careful not to lose any of the air.

4. Measure the diameter of each balloon using the band provided or using a set of large calipers and a ruler. Set the calipers across the center of the balloon making sure each balloon is measured the same way. Then set the calipers against the ruler to find the measurement. If you use the band, be certain to measure the center of the balloon.

5. Figure each students' lung capacity in the following manner:

   volume of a sphere is $\frac{4}{3} \pi r^3$

   For example: If the diameter is 8", the radius is 4", then the volume is 4/3 (3.14) 64 = 267.94 cubic inches. (Values for r^3 can be read directly from the chart on form 1.)

6. Find the average lung capacities of all the students. On a strictly voluntary basis, have the students divide into smoker and non-smoker groups and find lung capacities.

7. Have each student take their balloon home and find the lung capacities of parents, brothers, sisters, etc. Make sure they complete form 2 for each person tested.

8. Gather information and again figure average lung capacity for non-smokers versus smokers.

9. Have the students graph their data and make a set of transparencies to use in the class discussion.

10. As an extension of this activity the students might find average lung capacities by

    a. age
    b. work factors (office, factory)
    c. location (rural, urban)
    d. sex
    e. other factors which might affect lung capacity

31

OPTION #2 cont.

DISCUSSION QUESTIONS

1. Is there a difference in lung capacity between smokers and non-smokers?
2. What can we attribute this to?
3. How does the environment affect non-smokers?
4. Do you think that there may be other problems besides lung capacity?
5. Did your results show something you did not expect?

FORM 1

GLUE END TO END TO MAKE A BAND THAT READS THE RADIUS DIRECTLY.

NOTE: THIS CHART SHOWS RADIUS OF SPHERE.

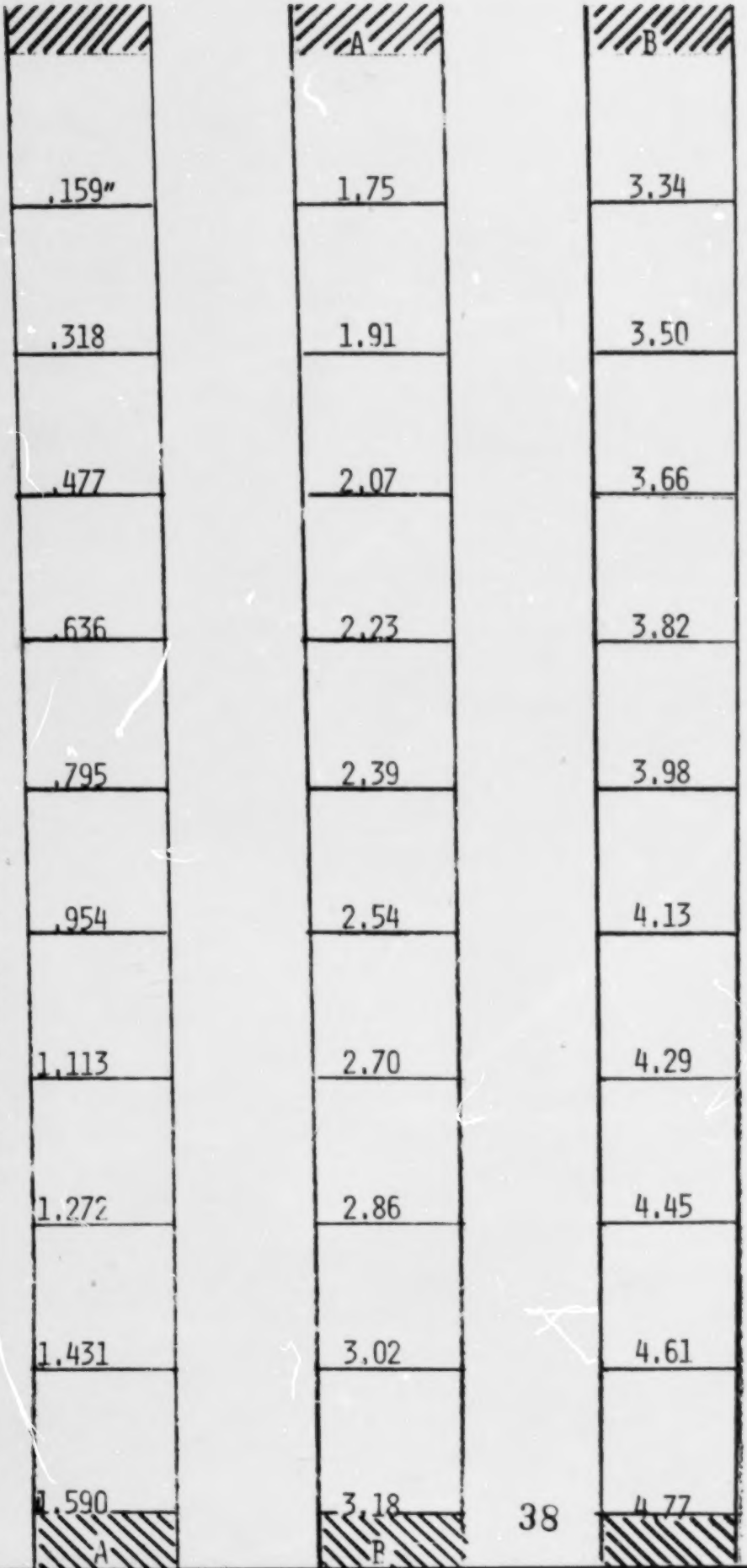


CHART OF R^3

R	R^3
1	1
1.2	1.73
1.4	2.94
1.6	4.08
1.8	5.78
2.0	8.0
2.2	10.61
2.4	13.80
2.6	17.60
2.8	22.00
3.0	27.00
3.2	32.90
3.4	39.30
3.6	46.80
3.8	55.0
4.0	64.0
4.2	74.1
4.4	85.8
4.6	97.8
4.8	111.0
5.0	125.0
5.2	141.0
5.4	158.0
5.6	176.0
5.8	196
6.0	216.0

FORM #2

LUNG TEST PROFILE

AGE: (CHECK ONE) 5-9____10-14____15-19____20-29____

30-39____40-49____50+____

SEX: MALE____FEMALE____ SMOKER: YES____NO____

LIVES IN: RURAL AREA____URBAN AREA____

WORKS IN: RURAL AREA____URBAN AREA____

WORKING CONDITIONS: CLEAN____VARIABLE____DIRTY____VERY DIRTY____

ANY LUNG DISEASES: YES____NO____

EXERCISE: NEVER____MONTHLY____WEEKLY____MORE THAN 3 TIMES WEEKLY____

LUNG TEST PROFILE

AGE: (CHECK ONE) 5-9____10-14____15-19____20-29____

30-39____40-49____50+____

SEX: MALE____FEMALE____ SMOKER: YES____NO____

LIVES IN: URBAN AREA____RURAL AREA____

WORKS IN: URBAN AREA____RURAL AREA____

WORKING CONDITIONS: CLEAN____VARIABLE____DIRTY____VERY DIRTY____

ANY LUNG DISEASES: YES____NO____

EXERCISE: NEVER____MONTHLY____WEEKLY____MORE THAN 3 TIMES WEEKLY____

LUNG TEST PROFILE

AGE: (CHECK ONE) 5-9____10-14____15-19____20-29____

30-39____40-49____50+____

SEX: MALE____FEMALE____ SMOKER: YES____NO____

LIVES IN: URBAN AREA____RURAL AREA____

WORKS IN: URBAN AREA____ RURAL AREA____

WORKING CONDITIONS: CLEAN____VARIABLE____DIRTY____VERY DIRTY____

ANY LUNG DISEASES: YES____NO____

EXERCISE: NEVER____MONTHLY____WEEKLY____MORE THAN 3 TIMES WEEKLY

OPTION #3

MATERIALS AND RESOURCES

Record player or radio
Can of bad-smelling aerosol
"Man's Impact on the Environment", Thomas R. Detwyler, McGraw-Hill, 1971

PROCEDURE:

1. At the beginning of the school week the students will have several stresses placed upon their classroom enviroment.

   a. Very dim lights in the room

   b. Very loud records, music the students dislike

   c. Bad odors

   d. Desks placed very close to one another or no desks at all

2. Students are to be told that this is their "new" environment and that class will be run as usual except that these stresses have now been added.

3. At the end of each day the students can vote to remove any stress. Thus, if after the first day they vote to spread the desks out, then the following day all the other stresses would remain in effect.

4. Let the class remove one stress daily. Keep track of how many students vote for removing each stress.

DISCUSSION QUESTIONS

1. How did the stresses affect you?

2. Why did you vote to remove a particular stress?

3. How does this relate to the environmental problems around us?

4. How about our environment of the future?

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to give an example of how by protecting the earth, it will be better able to meet the needs of all living things now and in the future.

SUBJECT AREAS:

Language Arts, Social Studies

KEY WORDS AND DEFINITIONS:

Allotment - share given to a person; the way in which something is distributed

Habitat - the place in which a plant or animal lives

OPTION #1

MATERIALS AND RESOURCES

3 x 5 cards
Ballot card master
Reality list

PROCEDURE:

A. First day

1. Select or elect a seven-man city council from the class.

2. Give each student a copy of the "roles" sheet.

3. Choose ten students or divide the remainder of the class into ten groups, each representing one of the persons described in the roles sheet.

4. The scene is 1977 and gasoline is at a premium. Gas allotment is a must. People must make a plea for the quantity of gasoline they consider "necessary". All the persons in the game have public transportation available to them unless otherwise specified.

5. All vehicles described get twenty miles per gallon.

6. Remind the students that the average person drives 1,000 miles monthly and therefore needs 50 gallons of gasoline. Be certain they note how much gas they will need each month.

7. Give each group or individual fifteen minutes to prepare an argument on why they need gas.

8. Allow each group or individual three minutes to present their views to the council on why they need gas.

9. After each group has presented their views, allow a short time for questions.

10. After every group has presented their plea, tell the council to take their ballot cards and allot 300 gallons of gas among the ten roles according to needs.

B. Second day

1. Present the council with one reality at a time from the list.

2. Have the council publicly evaluate the situations and possibly change the allotments.

DISCUSSION QUESTIONS

1. How fair was the system of alloting gas?

2. What other methods could be used?

OPTION #1 cont.

3. As an individual, what are your feelings about the gas given to you?
4. How can we better prepare ourselves to avoid such an allotment situation?
5. What are some other resources which man has wasted to such a dangerous level?
6. How realistic was the original allotment?
7. Why were the changes necessary?
8. Could the changes be predicted?

ROLES

Doctor

Your office and home are in the same building but the hospital where you perform your surgery is five minutes away. You also make housecalls. (1000 miles monthly)

Grocery store owner

As a grocery store owner you have always advertised FREE DELIVERY and to stop this practice might affect your business by as much as fifty percent. Your home is one mile from your store. (1000 miles monthly)

Attorney

Your suburban home is twenty miles from your office. There is no public transportation available. You also travel to court every day which is another ten miles daily. (1500 miles monthly)

Tradesman

Your carpentry and plumbing work take you all over the city. You only live eight miles from your shop but you drive about 1000 miles monthly on your job.

Teacher

You live fifteen miles from the school where you teach. Your wife also teaches and has her own auto which she drives to her school ten miles from home. (1500 miles monthly)

Traveling salesman

You travel about 2000 miles monthly. Without gasoline, you will not be able to sell your products.

Farmer

Your farm equipment uses gasoline and you must transport your goods to market. You are the only local farmer and you supply everyone else with their footstuff. (2000 miles monthly)

Serviceman

You service everything from TV sets to manual pencil sharpeners. Your housecalls use up about 1,500 miles monthly.

Politician

Your travels through the community take you away from your office for at least 2000 miles monthly. It is a necessity to get out to meet the public.

OPTION #1 "ROLES" BALLOT CARD

NAME	AMOUNT OF GASOLINE ALLOTTED
DOCTOR	
GROCERY STORE OWNER	
ATTORNEY	
TRADESMAN	
TEACHER	
TRAVELING SALESMAN	
FARMER	
SERVICEMAN	
POLITICIAN	

40

REALITIES LIST

1. Drought has persisted; water must be trucked in to save the crops.

2. As a service to the citizens, the doctor would like to make housecalls.

3. A truckers' strike is beginning its second month; the grocer must pick up his own supplies.

4. There is a major murder trial which requires a great deal of travel and investigation. The attorney believes his client is innocent.

5. Teachers would like to institute more field trips. They feel it would greatly aid education.

6. Campaigning has begun. The politician must travel more.

OPTION #2 - two or three days

MATERIALS AND RESOURCES

"The World Population Dilemma", Population Reference Bureau, Inc., Columbia Books, 1972.

PROCEDURE:

1. Find an empty classroom suitable for sending students to.
2. Arrange with other teachers to have their classes participate. The more students that participate makes for a better overcrowded situation. You should have at least double the usual amount.
3. Send a few students to the empty classroom. Do not send too many at once or the experiment will lose its effect.
4. To get the students into the room, invent an excuse such as, "So and So wishes to speak with you. It will only take a minute."
5. Keep sending more students to the room at regular intervals. The room should become so overcrowded that it becomes very uncomfortable.
6. After a good bit of time tell the students they are dismissed and to return to their classes.
7. On the following day or later that same day ask the students how they felt about their overcrowded environment.
8. Perhaps a short writing assignment having the students express their emotions would suffice.
9. Discuss this as it relates to our crowded society and the future of the world population.

DISCUSSION QUESTIONS

1. When did you begin to feel uncomfortable?
2. Were there certain people you tried to avoid?
3. Was there a certain place in the room you tried to get to?
4. Did anyone resort to violence?
5. What made you most uncomfortable?
6. What did you do or try to do to get comfortable?
7. Is it realistic to assume that our world will ever be this crowded? Why? Why not?
8. Are there any countries that have this problem today?
9. How has the problem manifested itself? - little food, unemployment, poor housing, etc.

OPTION #3

MATERIALS AND RESOURCES

Seasonal Adventures: The World of Plants and Animals, SVE, Chicago
Problem cards, included

PROCEDURE:

1. To prepare the students for their own investigations, show them the appropriate filmstrips from the SVE kit listed above. If this is not available, have the students investigate books, articles, etc. dealing with detection of interesting items in nature:

   a. animal tracks
   b. animal habitats
   c. wildflowers
   d. types of grasses
   e. soil types

   The list is endless.

2. Next, take a nature walk and have the students look for the things they have studied, using the problem cards as a guide.

3. Keep in mind that these problem cards are only samples. Students can create their own for different topics of interest to them.

DISCUSSION QUESTIONS

1. In your findings what type of interrelationships did you see between plant and animal, plant and soil, animal and soil, etc.

2. What evidence did you find of man's interaction with animals or plants?

3. What short range (seasonal) changes are apparent? What long range (5-10 years) changes are apparent?

4. Does man affect these changes? In a good or bad way?

5. Does man have a duty to preserve his natural surroundings?

OPTION #3 PROBLEM CARDS

CARD A

1. Explore as many places (environments or habitats) as you can from _____ to _____ and record animals that you have seen or their evidences; record amounts of evidences and animals you observed.

2. Look for and list evidence or signs of animals such as partly consumed food, excrement, homes, bird nests, feathers, etc.

3. Observe and list different habitats for wildlife in the area such as grass, cultivated field, hedges, swamp, etc.

4. Observe and list animal food in the area. What is growing there that can be eaten by animal life.

5. What is man's effect on the area you observed.

CARD B

Select three different habitats and compare the number of animal organisms and the characteristics in each.

HABITAT I -
CHARACTERISTICS

HABITAT II -
CHARACTERISTICS

HABITAT III
CHARACTERISTICS

Look for evidence of any animal changing the habitat. Did any living thing destroy plants?

Describe how you feel about man's effect on one animal or plant habitat you observed.

OPTION #3 PROBLEM CARDS

CARD C

Describe your observations of soil. Keep the description for the final session.

Study a few inches of soil. Stake out a 2'x2' section and sift through about three inches of soil recording the evidence of plants and animals you observe.

Name or description of item in the soil	Quantity	Possible effects on the soil

CARD D

Investigate plant life you see. Which of these plants are edible? How must they be prepared? Be careful because many plants are edible only after proper preparation.

Could man survive from the area plants alone?

FURTHER ACTIVITIES

1. Have the students design a project through which they can help the environment. Have them work out the details, materials, etc.

2. Design a can cruncher small enough to be used around the home. Keep in mind the following considerations:

   a. cost
   b. size
   c. ease of operation
   d. electrical or manual
   e. originality of design
   f. safety
   g. speed
   h. efficiency
   i. neatness of design

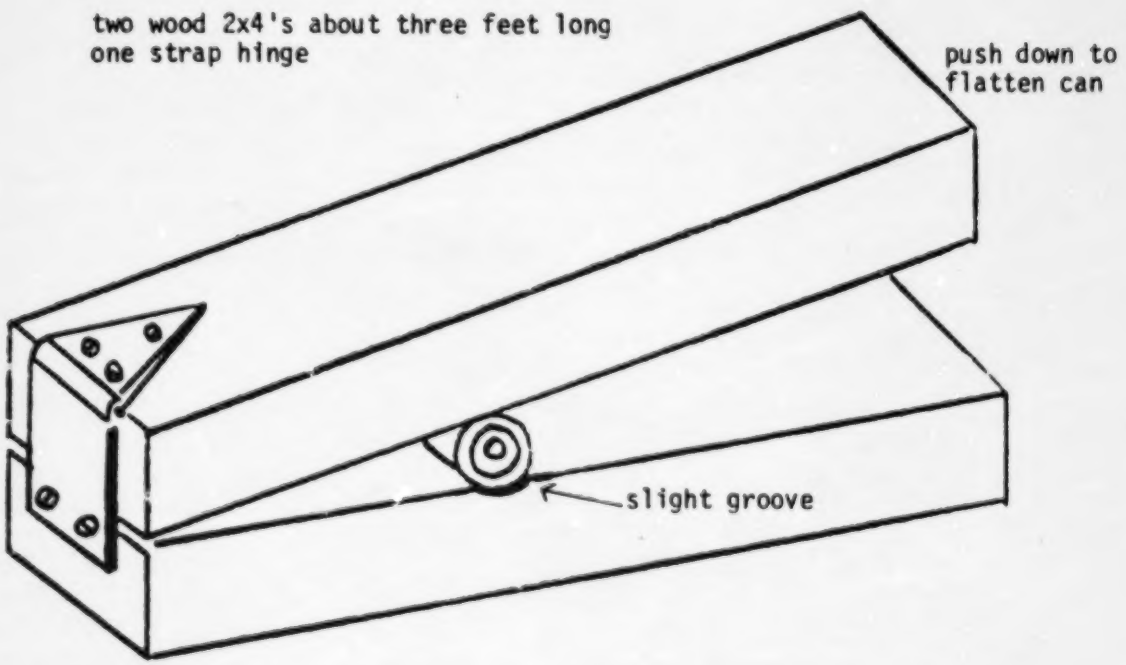
   This project might be too complex and so if possible have the students work in groups.

   If a shop is available, it might be conducted in coordination with a shop exercise so students can actually build the can cruncher.

DO-IT-YOURSELF CAN SQUASHER

MATERIALS NEEDED:

two wood 2x4's about three feet long
one strap hinge



If a slight groove is made in the bottom 2x4, the can you are crushing will not have a tendency to roll.

FURTHER ACTIVITIES cont.

3. Students are to secure a standard brick.

   a. Have the students measure the length, width, and depth of water in their toilet tank to figure volume.

   b. Students can actually drain water from the tanks and measure volume.

   c. Volume can be converted into gallons, cubic inches, cubic feet, quarts, liters, etc.

   d. Measure the brick and figure its volume. This unit should be the same as used for the toilet tank. Figure out how much water it would displace.

   e. Using population figures for the community, figure out how much water is consumed each day if each person were to flush toilets only once daily. Also have students figure out the total amount that could be saved by placing a brick in each toilet tank.